Applicants amended claims 1 and 9 to more particularly set forth the features of the invention. Particularly, claim 1 recites an eight-member ring porous framework structure and a catalytically active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. Claim 9 recites a crystalline silicoaluminophosphate molecular sieve having an eight-member ring porous framework structure and an active integrated aromatic hydrocarbon co-catalyst contained within the eight-member ring porous framework structure. Support for the amendment is found in the specification on page 8, lines 1-2 and on page 11, line 18-32. Claims 7 and 15 have been amended to remove from the markush group items that do not have eight-member ring porous framework structures. No new matter was added by any of these amendments. Applicants request entry of this amendment at this time.

For the reasons that follow, Applicants believe all claims are in condition for allowance and respectfully request reconsideration of this application.

I. Claims 1-16 Are Not Obvious In View of Kaiser.

The Examiner has rejected claims 1-16 in view of U.S. Patent No. 4,677,242 to Kaiser (Kaiser). Claim 1 recites a crystalline silicoaluminophosphate molecular sieve. The sieve comprises an eight-member ring porous framework structure and a catalytically active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The sieve is further characterized as having a catalytic activity index for methanol conversion at 250°C of at least 2.

Claim 9 recites a catalyst for converting an oxygenate feedstock to an olefin product, comprising a crystalline silicoaluminophosphate molecular sieve having an eight-member ring porous framework structure, and a binder. The porous framework structure contains an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The silicoaluminophosphate has a catalytic activity index for methanol conversion at 250°C of at least 2.

Claims 2-8 depend from claim 1 and therefore contain all of the elements of claim 1. Claims 10-16 depend from claim 9 and therefore contain all of the elements of claim 9.

Kaiser does not teach an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims 1 and 9. Kaiser teaches a process for the production of light olefins from a feedstock comprising contacting a silicoaluminophosphate molecular sieve in the presence of an aromatic diluent. Specifically, Kaiser states, "The diluent is correlated to the selected silicoaluminophosphate molecular sieve such that the average kinetic diameter of the diluent is greater than the median pore size of the silicoaluminophosphate molecular sieve." Thus, the aromatic diluent is outside the pores of the silicoaluminophosphate molecular sieve. The present invention as set forth in claims 1 and 9 teach "an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims". This is opposite an external feed that has a kinetic diameter that would prevent the feed from entering the pores.

Additionally, there is a significant advantage to the present invention over the teaching of Kaiser. Because the integrated aromatic hydrocarbon co-catalyst is within the eight-member ring porous framework structure, the use of this molecular sieve or catalyst results in an increases the amount of ethylene produced while containing the co-catalyst in the porous framework structure. Thus, the product effluent stream has the benefit of an increased ethylene yield--as much as 10 wt.%. Furthermore, this benefit is accomplished without having more than trace amounts of aromatic hydrocarbons in the product effluent stream.

The Kaiser patent teaches the addition of aromatics, which pass through the reactor into the product effluent stream. Regardless of the benefit, the product effluent stream in Kaiser has a more expensive clean up--particularly an aromatic recovery and recycle. Thus, the present invention has a significant advantage over the teaching of Kaiser.

Claims 1 and 9 as well as dependent claims 2-8 and 10-16 are patentable over Kaiser.

II. Claims 17-30 and 50-66 Are Not Obvious In View of Brown et al.

The Examiner has rejected claims 1-16 in view of U.S. Patent No. 6,046,372 to Brown et al. (Brown).

Brown does not teach an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims 1 and 9. Brown teaches a process for the production of light olefins from a feedstock comprising contacting a porous crystalline material having a pore size greater than the critical diameter of the aromatic compound. Specifically, Brown states, "Preferred catalyst have a pore size between 5 and 7 Angstroms and in particular intermediate pore size aluminosilicate zeolites."

The present pending claims 1-9 includes a silicoaluminophosphate molecular sieve that has eight-member zeolite rings. An eight-member silicoaluminophosphate molecular sieve has a pore size ranging from 3.5 to 5 Angstroms. Furthermore, the claims require an integrated aromatic hydrocarbon co-catalyst that is integrated within eight-member ring porous framework structure. As understood by a person of ordinary skill in view of the specification of the present invention, the smallest aromatic hydrocarbon, is benzene. Benzene has a critical diameter greater than 5 Angstroms. All other aromatic hydrocarbon compounds have a critical diameter greater than 5 Angstroms. See Declaration of Teng Xu, paragraph 8.

The present invention is distinguishable over Brown because the pore size of the catalyst in Brown must be greater than the critical diameter of the aromatic compound co-feed--particularly greater than 5 Angstroms. In the present invention, the pore size is smaller than the aromatic hydrocarbon compound. See Declaration of Teng Xu, paragraph 9.

There is a significant advantage to the present invention over the teaching of Brown. The aromatic diluent of Brown, because it is smaller than the pore size of the catalyst freely passes from the pores into the product effluent stream. In contrast, the aromatic

hydrocarbon co-catalyst of the present invention is larger than the pore size of the eight-member ring porous framework structure and is within the eight-member ring porous framework structure. Thus, the hydrocarbon co-catalyst does not leave the porous framework structure and pass into the effluent stream. The use of the molecular sieve of claim 1 or the catalyst of claim 9 results in an increase in the amount of ethylene produced--as much as a ten percent increase. This is accomplished with a product stream that has no more than trace amounts of aromatic in the product effluent stream. See Declaration of Teng Xu, paragraph 10.

The discovery of the present invention is a significant benefit to the technical field of making olefins from oxygenate feedstock. Claims 1 and 9 as well as dependent claims 2-8 and 10-16 are patentable over Brown.

III. Claims 17-30 and 50-66 Are Not Obvious In View of Kuechler I.

The Examiner has rejected claims 1-16 in view of U.S. Patent No. 6,137,022 to Kuechler et al. (Kuechler I).

Kuechler I does not teach an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims 1 and 9. Kuechler I teaches a process for converting an oxygenate to an olefin with a silicoaluminophosphate molecular sieve catalyst. The oxygenate feed optionally includes an aromatic diluent. To the extent that Kuechler I teaches an 8-member silicoaluminophosphate molecular sieve, the aromatic diluent cannot penetrate the pores of the molecular sieve catalyst because the pores are smaller than the critical diameter of the aromatic ring. See Declaration of Teng Xu, paragraphs 8-9. Accordingly, the present invention is patentable over Kuechler I for the same reason it is patentable over the Kaiser reference. To the extent that Kuechler I teaches a larger than eight-member ring, the present invention is patentable over Kuechler I for the same reason it is patentable over Brown.

Claims 1 and 9 as well as dependent claims 2-8 and 10-16 are patentable over Kuechler I.

IV. Claims 1-16 Are Not Obvious In View of Kuechler II.

The Examiner has rejected claims 1-16 in view of U.S. Patent No. 6,437,208 to Kuechler et al. (Kuechler II). Kuechler II does not teach an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims 1 and 9. Kuechler II teaches a process for converting an oxygenate to an olefin with a silicoaluminophosphate molecular sieve catalyst. The oxygenate feed optionally includes an aromatic diluent. To the extent that Kuechler II teaches an 8-member silicoaluminophosphate molecular sieve, the aromatic diluent cannot penetrate the pores of the molecular sieve catalyst because the pores are smaller than the critical diameter of the aromatic diluent. See Declaration of Teng Xu, paragraphs 8-9. Accordingly, the present invention is patentable over Kuechler II for the same reason it is patentable over the Kaiser reference. To the extent that Kuechler II teaches a larger than eight-member ring, the present invention is patentable over Kuechler II for the same reason it is patentable over Brown.

Claims 1 and 9 as well as dependent claims 2-8 and 10-16 are patentable over Kuechler II.

Applicants invite the Examiner to telephone the undersigned attorney if there are any issues outstanding which have not been presented to the Examiner's satisfaction.

Respectfully submitted,

4/18/03
Date

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APPENDIX A
CLAIMS MARKED-UP TO SHOW CHANGES MADE

1. A crystalline silicoaluminophosphate molecular sieve comprising an eight-member ring porous framework structure and a catalytically active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure,
wherein the silicoaluminophosphate molecular sieve has a catalytic activity index for methanol conversion at 250°C of at least 2.

7. The crystalline silicoaluminophosphate molecular sieve of claim 1, wherein the silicoaluminophosphate molecular sieve is selected from the group consisting of ~~SAPO-5, SAPO-8, SAPO-11, SAPO-16,~~ SAPO-17, SAPO-18, ~~SAPO-20, SAPO-31,~~ SAPO-34, SAPO-35, ~~SAPO-36, SAPO-37, SAPO-40, SAPO-41,~~ SAPO-42, SAPO-44, SAPO-47, SAPO-56, the metal containing forms thereof, and mixtures thereof.

9. A catalyst for converting an oxygenate feedstock to an olefin product, comprising a crystalline silicoaluminophosphate molecular sieve having an eight-member ring porous framework structure, and a binder, wherein the porous framework structure contains an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure,
wherein the silicoaluminophosphate molecular sieve has a catalytic activity index for methanol conversion at 250°C of at least 2.

15. The catalyst of claim 9, wherein the silicoaluminophosphate molecular sieve is selected from the group consisting of ~~SAPO-5, SAPO-8, SAPO-11, SAPO-16,~~ SAPO-17, SAPO-18, ~~SAPO-20, SAPO-31,~~ SAPO-34, SAPO-35, ~~SAPO-36, SAPO-37, SAPO-40, SAPO-41,~~ SAPO-42, SAPO-44, SAPO-47, SAPO-56, the metal containing forms thereof, and mixtures thereof.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	BEFORE THE EXAMINER:
Xu et al.	Bekir L. Yildirim
Serial No.: 09/511,943	Group Art Unit No.: 1764
Filed: February 24, 2000	Attorney Docket No.: 2000B009
For: Catalyst Pretreatment in an Oxygenate to Olefins Reaction	Baytown, Texas April 18, 2003

Commissioner for Patents
Washington, D.C. 20231

DECLARATION OF DR TENG XU

Dear Sir:

I, Teng Xu hereby declare and state as follows:

1. I am an inventor on the above-referenced application.

2. I received my Bachelor of Science degree in Chemistry at Zhejiang Institute of Technology in 1985. I received my Master of Science degree in Chemistry at Shanghai University of Technology in 1988. I received my Doctor of Philosophy degree in Chemistry at Texas A&M University in 1996. After graduation I completed a post doctorate study with Dr James Haw at Texas A& M University.

3. On or about June 1998, I accepted employment with ExxonMobil Chemical Company to conduct scientific research in the field of oxygenate to olefin conversion. During my employment at ExxonMobil, I discovered a novel molecular sieve and catalyst compound as set forth in claims 1 and 9 of the above-referenced application.

4. Claim 1 of the above referenced patent application recites a crystalline silicoaluminophosphate molecular sieve. The sieve comprises an eight-member ring porous framework structure and a catalytically active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The sieve is further characterised as having a catalytic activity index for methanol conversion at 250°C of at least 2.

5. Claim 9 of the above-referenced patent application recites a catalyst for converting an oxygenate feedstock to an olefin product, comprising a crystalline silicoaluminophosphate molecular sieve having an eight-member ring porous framework structure and a binder. The porous framework structure contains an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure. The silicoaluminophosphate has a catalytic activity index for methanol conversion at 250°C of at least 2.

6. I understand that the examiner has rejected claims 1 and 9 over U.S. Patent No. 6,046,372 to Brown et al. (Brown). I have reviewed the Brown reference and am familiar with its content.

7. Brown does not teach an active integrated aromatic hydrocarbon co-catalyst within the eight-member ring porous framework structure as required by claims 1 and 9. Brown teaches a process for the production of light olefins from a feedstock comprising contacting a porous crystalline material having a pore size greater than the critical diameter of the aromatic compound. Specifically, Brown states, "Preferred catalyst have a pore size between 5 and 7 Angstrom and in particular intermediate pore size aluminosilicate zeolites."

8. The present invention claims/includes a silicoaluminophosphate molecular sieve that has 8-member zeolite rings. An 8-member silicoaluminophosphate molecular sieve has a pore size ranging from 3.5 to 5 Angstroms. Furthermore,

the claims require an integrated aromatic hydrocarbon co-catalyst that is integrated within 8-member ring porous framework structure. As understood by a person of ordinary skill in view of the specification of the present invention, the smallest aromatic hydrocarbon, is benzene. Benzene has a critical diameter greater than 5 Angstroms. All other aromatic hydrocarbon compounds have a critical diameter greater than 5 Angstroms.

9. The present invention is distinguishable over Brown because the pore size of the catalyst in Brown must be greater than the critical diameter of the aromatic compound co-feed--particularly greater than 5 Angstroms. In the present invention, the pore size is smaller than the aromatic hydrocarbon compound.

10. There is a big advantage to the present invention over the teaching of Brown. The aromatic diluent of Brown, because it is smaller than the pore size of the catalyst, freely passes from the pores into the product effluent stream. In contrast, the aromatic hydrocarbon co-catalyst of the present invention is larger than the pore size of the eight-member ring porous framework structure and is within the eight-member ring porous framework structure. Thus, the hydrocarbon co-catalyst does not leave the porous framework structure and pass into the effluent stream. The use of the molecular sieve of claim 1 or the catalyst of claim 9 results in an increase in the amount of ethylene produced--as much as a ten percent increase. This is accomplished with a product stream that has no more than trace levels of aromatics. I believe that the discovery of the present invention is a significant benefit to the technical field of making olefins from oxygenate feedstock.

11. I hereby declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or

both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application of any patent issuing thereon.

04/18/2003
Date

Teng Xu
Teng Xu